

[DOCUMENT NAME] SCOPE OF CLAIM FOR PATENT

1 A positioning system for determination a position of
wireless station that is an object of positioning using
measuring a communication situation between a said
5 wireless station that is an object of positioning and each
of a plurality of wireless stations other than said
wireless station that is an object of positioning,
characterized in including:

a database having identification information of said
10 wireless station that is an object of positioning, or
identification information of said plurality of said
wireless stations and necessary measurement number-of-
times conclusion information for drawing a conclusion on a
measurement number of times stored correspondingly to each
15 other, said necessary measurement number-of-times
conclusion information derived from a characteristic of
said wireless station that is an object of positioning, or
a characteristic of said plurality of said wireless
stations, or a characteristic of a combination of said
20 wireless station that is an object of positioning and said
plurality of said wireless stations; and

a means for receiving identification information of
said wireless station that is an object of positioning, or
identification information of said plurality of said
25 wireless stations, for retrieving necessary measurement

number-of-times conclusion information corresponding to
this identification information from said database, and
for deciding the measurement number of times based upon
this necessary measurement number-of-times conclusion
5 information.

2 A positioning system for measuring a communication
situation between a wireless station that is an object of
positioning and each of a plurality of wireless stations
10 other than said wireless station that is an object of
positioning, thereby to specify a position of said
wireless station that is an object of positioning,
characterized in including:

a database having a first table, said first table
15 having identification information of said wireless station
and group information, being information associated with a
group of which a characteristic resembles the wireless
station, caused to correspond to each other, and a second
table filed, said second table having said group
20 information and necessary measurement number-of-times
conclusion information caused to correspond to each other;
and

a means for receiving identification information of
said wireless station that is an object of positioning, or
25 identification information of said plurality of said

wireless stations, for retrieving group information
corresponding to this identification information from said
first table, for retrieving necessary measurement number-
of-times conclusion information corresponding to this
5 group information from said second table, and for deciding
a measurement number of times based upon this necessary
measurement number-of-times conclusion information.

3 The positioning system according to claim 2,
10 characterized in that said group information is at least
one of a model number of the wireless station, a model
number of an IC for wireless communication mounted onto
the wireless station, manufacturer information of an IC
for wireless communication mounted onto the wireless
15 station, and wireless communication technique information
to which the IC for wireless communication mounted onto
the wireless station corresponds.

4 The positioning system according to claim 2,
20 characterized in including a means for acquiring MIB
information, thereby to acquire said group information.

5 The positioning system according to claim 2,
characterized in that said necessary measurement number-
25 of-times conclusion information is a measurement number of

times.

6 The positioning system according to claim 2,
characterized in that said necessary measurement number-
5 of-times conclusion information is a standard deviation of
a dispersion in an internal process delay in the wireless
station that is an object of positioning or the other
wireless station.

10 7 The positioning system according to claim 2,
characterized in including a means for updating necessary
measurement number-of-times conclusion information based
upon an acquired measurement result.

15 8 The positioning system according to claim 7,
characterized in that the means for updating necessary
measurement number-of-times conclusion information
performs an operational process weighted with a total
measurement number of times for the necessary measurement
20 number-of-times conclusion information and the measurement
result, thereby to update the necessary measurement
number-of-times conclusion information.

9 The positioning system according to claim 7,
25 characterized in that the means for updating necessary

measurement number-of-times conclusion information
performs an operational process weighted with a total
measurement number of times for the necessary measurement
number-of-times conclusion information, the acquired
5 measurement result, and a past measurement result, thereby
to update the necessary measurement number-of-times
conclusion information.

10 The positioning system according to claim 2,
10 characterized in that said measurement of said
communication situation is a measurement of a radio wave
propagation time.

11 The positioning system according to claim 2,
15 characterized in that said plurality of said wireless
stations perform said measurement of said communication
situation.

12 The positioning system according to claim 2,
20 characterized in that said wireless station that is an
object of positioning performs said measurement of said
communication situation.

13 The positioning system according to claim 2,
25 characterized in that said wireless station performing

said measurement of said communication situation is a wireless base station.

14 The positioning system according to claim 2,
5 characterized in that said wireless station performing said measurement of said communication situation is a wireless terminal station.

15 The positioning system according to claim 2,
10 characterized in that the decision of said measurement number of times of said communication situation is performed by a positioning server having a connection with each of said plurality of said wireless stations via a network.

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16 The positioning system according to claim 2,
characterized in that the decision of said measurement number of times of said communication situation is performed by said plurality of said wireless stations.

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17 The positioning system according to claim 2,
characterized in that the decision of said measurement number of times of said communication situation is performed by said wireless station that is an object of
25 positioning.

18 The positioning system according to claim 2,
characterized in that said necessary measurement number-
of-times conclusion information is information prepared by
5 taking into consideration the characteristic of the
wireless station that is an object of positioning, or the
characteristic of the wireless station other than the
wireless station that is an object of positioning, or the
characteristic of a combination of the wireless station
10 that is an object of positioning and the wireless station
other than the wireless station that is an object of
positioning, and a positioning quality that is requested.

19 The positioning system according to claim 18,
15 characterized in that said quality of said positioning is
positioning precision information.

20 The positioning system according to claim 18,
characterized in that said quality of said positioning is
20 use application information.

21 The positioning system according to claim 2,
characterized in that said identification information of
said wireless station is at least one of a person name
25 using the wireless station, a personal ID of a person

using the wireless station, an appliance name registered to a wireless station appliance, an MAC address of the wireless station, an IP address of the wireless station, and an arbitrary ID allocated to the wireless station.

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22 A positioning system for measuring a communication situation between a wireless station that is an object of positioning and each of a plurality of wireless stations other than said wireless station that is an object of positioning, thereby to specify a position of said wireless station that is an object of positioning, characterized in including a means for deciding a measurement number of times of the communication situation based upon a characteristic of said wireless station that is an object of positioning, or a characteristic of said plurality of said wireless stations, or a characteristic of a combination of said wireless station that is an object of positioning and said plurality of said wireless stations.

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23 A positioning server for deciding a measurement number of times of a communication situation in a positioning system for measuring a communication situation between a wireless station that is an object of positioning and each of a plurality of wireless stations other than said

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wireless station that is an object of positioning, thereby to specify a position of said wireless station that is an object of positioning, characterized in including:

a database having identification information of said
5 wireless station that is an object of positioning, or
identification information of said plurality of said
wireless stations and necessary measurement number-of-
times conclusion information for drawing a conclusion on
the measurement number of times stored correspondingly to
10 each other, said necessary measurement number-of-times
conclusion information derived from a characteristic of
said wireless station that is an object of positioning, or
a characteristic of said plurality of said wireless
stations, or a characteristic of a combination of said
15 wireless station that is an object of positioning and said
plurality of said wireless stations; and

a means for receiving identification information of
said wireless station that is an object of positioning, or
identification information of said plurality of said
20 wireless stations, for retrieving necessary measurement
number-of-times conclusion information corresponding to
this identification information from said database, and
for deciding the measurement number of times based upon
this necessary measurement number-of-times conclusion
25 information.

24 A positioning server for deciding a measurement number of times of a communication situation in a positioning system for measuring a communication situation between a wireless station that is an object of positioning and each of a plurality of wireless stations other than said wireless station that is an object of positioning, thereby to specify a position of said wireless station that is an object of positioning, characterized in including:

10 a database having a first table, said first table having identification information of said wireless station and group information, being information associated with a group of which a characteristic resembles that of the wireless station, caused to correspond to each other, and
15 a second table filed, said second table having said group information and necessary measurement number-of-times conclusion information caused to correspond to each other, filed; and

a means for receiving identification information of
20 said wireless station that is an object of positioning, or identification information of said plurality of said wireless stations, for retrieving group information corresponding to this identification information from said first table, for retrieving necessary measurement number-
25 of-times conclusion information corresponding to this

group information from said second table, and for deciding the measurement number of times based upon this necessary measurement number-of-times conclusion information.

5 **25** The positioning server according to claim 24,
characterized in that said group information is at least
one of a model number of the wireless station, a model
number of an IC for wireless communication mounted onto
the wireless station, manufacturer information of an IC
10 for wireless communication mounted onto the wireless
station, and wireless communication technique information
to which the IC for wireless communication mounted onto
the wireless station corresponds.

15 **26** The positioning server according to claim 24,
characterized in including a means for acquiring MIB
information, thereby to acquire said group information.

20 **27** The positioning server according to claim 24,
characterized in that said necessary measurement number-
of-times conclusion information is a measurement number of
times.

25 **28** The positioning server according to claim 24,
characterized in that said necessary measurement number-

of-times conclusion information is a standard deviation of a dispersion in an internal process delay in the wireless station that is an object of positioning or the other wireless station.

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29 The positioning server according to claim 24, characterized in including a means for updating the necessary measurement number-of-times conclusion information based upon an acquired measurement result.

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30 The positioning server according to claim 29, characterized in that the means for updating necessary measurement number-of-times conclusion information performs an operational process weighted with a total

15 measurement number of times for the necessary measurement number-of-times conclusion information and the measurement result, thereby to update the necessary measurement number-of-times conclusion information.

20 **31** The positioning server according to claim 29, characterized in that the means for updating necessary measurement number-of-times conclusion information performs an operational process weighted with a total measurement number of times for the necessary measurement
25 number-of-times conclusion information, the acquired

measurement result, and a past measurement result, thereby to update the necessary measurement number-of-times conclusion information.

5 **32** The positioning server according to claim 24, characterized in that said measurement of said communication situation is a measurement of a radio wave propagation time.

10 **33** The positioning server according to claim 24, characterized in having a connection with each of said plurality of said wireless stations via a network.

34 The positioning server according to claim 24,
15 characterized in that said necessary measurement number-of-times conclusion information is information prepared by taking into consideration a characteristic of a wireless station that is an object of positioning, or a characteristic of a wireless station other than said
20 wireless station that is an object of positioning, or a characteristic of a combination of said wireless station that is an object of positioning and the wireless station other than said wireless station that is an object of positioning, and a positioning quality that is requested.

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35 The positioning server according to claim 34,
characterized in that said quality of said positioning is
positioning precision information.

5 36 The positioning server according to claim 34,
characterized in that said quality of said positioning is
use application information.

37 The positioning server according to claim 24,
10 characterized in that said identification information of
said wireless station is at least one of a person name
using the wireless station, a personal ID of a person
using the wireless station, an appliance name registered
to a wireless station appliance, an MAC address of the
15 wireless station, an IP address of the wireless station,
and an arbitrary ID allocated to the wireless station.

38 A program for causing an information processing unit
to perform a process of deciding a measurement number of
20 times of a communication situation in a positioning system
for measuring a communication situation between a wireless
station that is an object of positioning and each of a
plurality of wireless stations other than said wireless
station that is an object of positioning, thereby to
25 specify a position of said wireless station that is an

object of positioning, characterized in causing said
information processing unit to function as a means for
receiving identification information of said wireless
station that is an object of positioning, or
5 identification information of said plurality of said
wireless stations, for retrieving necessary measurement
number-of-times conclusion information corresponding to
the received identification information from a database
having identification information of said wireless station
10 that is an object of positioning, or identification
information of said plurality of said wireless stations
and necessary measurement number-of-times conclusion
information for drawing a conclusion on the measurement
number of times stored correspondingly to each other, said
15 necessary measurement number-of-times conclusion
information derived from a characteristic of said wireless
station that is an object of positioning, or a
characteristic of said plurality of said wireless stations,
or a characteristic of a combination of said wireless
20 station that is an object of positioning and said
plurality of said wireless stations, and for deciding the
measurement number of times based upon this necessary
measurement number-of-times conclusion information.

25 39 A program for causing an information processing unit

to perform a process of deciding a measurement number of
times of a communication situation in a positioning system
for measuring a communication situation between a wireless
station that is an object of positioning and each of a
5 plurality of wireless stations other than said wireless
station that is an object of positioning, thereby to
specify a position of said wireless station that is an
object of positioning, characterized in causing said
information processing unit to function as a means for
10 receiving identification information of said wireless
station that is an object of positioning, or
identification information of said plurality of said
wireless stations, for retrieving group information
corresponding to this identification information from a
15 table having said identification information of said
wireless station and group information, being information
associated with a group of which a characteristic
resembles that of the wireless station, caused to
correspond to each other, retrieving necessary measurement
20 number-of-times conclusion information corresponding to
this group information from a table having said group
information and the necessary measurement number-of-times
conclusion information caused to correspond to each other,
and for deciding the measurement number of times based
25 upon this necessary measurement number-of-times conclusion

information.

40 The program according to claim 39, characterized in
that said group information is at least one of a model
5 number of the wireless station, a model number of an IC
for wireless communication mounted onto the wireless
station, manufacturer information of an IC for wireless
communication mounted onto the wireless station, and
wireless communication technique information to which the
10 IC for wireless communication mounted onto the wireless
station corresponds.

41 The program according to claim 39, characterized in
causing said information processing unit to function as a
15 means for acquiring MIB information, thereby to acquire
said group information.

42 The program according to claim 39, characterized in
that said necessary measurement number-of-times conclusion
20 information is a measurement number of times.

43 The program according to claim 39, characterized in
that said necessary measurement number-of-times conclusion
information is a standard deviation of a dispersion in an
25 internal process delay in the wireless station that is an

object of positioning or the other wireless station.

44 The program according to claim 39, characterized in causing the information processing unit to function as a
5 means for updating the necessary measurement number-of-times conclusion information of the database based upon an acquired measurement result.

45 The program according to claim 39, characterized in
10 causing the information processing unit to function as a means for performing an operational process weighted with a total measurement number of times for the necessary measurement number-of-times conclusion information and a measurement result, thereby to update the necessary
15 measurement number-of-times conclusion information of the database.

46 The program according to claim 39, characterized in causing the information processing unit to function as a
20 means for performing an operational process weighted with a total measurement number of times for the necessary measurement number-of-times conclusion information, an acquired measurement result, and a past measurement result, thereby to update the necessary measurement number-of-
25 times conclusion information of the database.

47 The program according to claim 39, characterized in
that said measurement of said communication situation is a
measurement of a radio wave propagation time.

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48 The program according to claim 39, characterized in
that the information processing unit has a connection with
each of said plurality of said wireless stations via a
network.

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49 The program according to claim 39, characterized in
that said necessary measurement number-of-times conclusion
information is information prepared by taking into
consideration a characteristic of the wireless station
15 that is an object of positioning, or a characteristic of
the wireless station other than the wireless station that
is an object of positioning, or a characteristic of a
combination of said wireless station that is an object of
positioning and the wireless station other than said
20 wireless station that is an object of positioning, and a
positioning quality that is requested.

50 The program according to claim 49, characterized in
that said quality of said positioning is positioning
25 precision information.

51 The program according to claim 49, characterized in that said quality of said positioning is use application information.

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52 The program according to claim 39, characterized in that said identification information of said wireless station is at least one of a person name using the wireless station, a personal ID of a person using the wireless station; an appliance name registered to a wireless station appliance, an MAC address of the wireless station, an IP address of the wireless station, and an arbitrary ID allocated to the wireless station.

15 53 A method of deciding a measurement number of times in a positioning system for measuring a communication situation between a wireless station that is an object of positioning and each of a plurality of wireless stations other than said wireless station that is an object of positioning, thereby to specify a position of said wireless station that is an object of positioning, characterized in including a step of deciding the measurement number of times of the communication situation based upon a characteristic of said wireless station that is an object of positioning, or a characteristic of said

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plurality of said wireless stations, or a characteristic of a combination of said wireless station that is an object of positioning and said plurality of said wireless stations.

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54 The method of deciding the measurement number of times according to claim 53, characterized in including the steps of:

pre-storing identification information of said
10 wireless station that is an object of positioning, or identification information of said plurality of said wireless stations, and necessary measurement number-of-times conclusion information for drawing a conclusion on the measurement number of times correspondingly to each
15 other, said necessary measurement number-of-times conclusion information derived from the characteristic of said wireless station that is an object of positioning, or the characteristic of said plurality of said wireless stations, or the characteristic of a combination of said
20 wireless station that is an object of positioning and said plurality of said wireless stations; and

retrieving necessary measurement number-of-times conclusion information corresponding to the received identification information of the wireless station that is
25 an object of positioning, or to the received

identification information of the plurality of the wireless stations to decide the measurement number of times based upon this necessary measurement number-of-times conclusion information. .

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55 The method of deciding the measurement number of times according to claim 53, characterized in including the steps of:

pre-storing identification information of the wireless station and the necessary measurement number-of-times conclusion information via group information, being information associated with a group of which the characteristic resembles that of the wireless station, correspondingly to each other; and

15 retrieving necessary measurement number-of-times conclusion information corresponding to the received identification information of the wireless station that is an object of positioning, or to the received identification information of the plurality of the wireless stations via the group information to decide the measurement number of times based upon this necessary measurement number-of-times conclusion information.

56 The method of deciding the measurement number of times according to claim 55, characterized in that said group

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information is at least one of a model number of the wireless station, a model number of an IC for wireless communication mounted onto the wireless station, manufacturer information of an IC for wireless

5 communication mounted onto the wireless station, and wireless communication technique information to which the IC for wireless communication mounted onto the wireless station corresponds.

10 **57** The method of deciding the measurement number of times according to claim 55, characterized in including a step of acquiring MIB information, thereby to acquire said group information.

15 **58** The method of deciding the measurement number of times according to claim 53, characterized in that said necessary measurement number-of-times conclusion information is a measurement number of times.

20 **59** The method of deciding the measurement number of times according to claim 53, characterized in that said necessary measurement number-of-times conclusion information is a standard deviation of a dispersion in an internal process delay in the wireless station that is an
25 object of positioning or the other wireless station.

60 The method of deciding the measurement number of times according to claim 53, characterized in including a step of updating the necessary measurement number-of-times
5 conclusion information based upon an acquired measurement result.

61 The method of deciding the measurement number of times according to claim 60, characterized in including a step
10 of performing an operational process weighted with a total measurement number of times for the necessary measurement number-of-times conclusion information and the measurement result, thereby to update the necessary measurement number-of-times conclusion information.

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62 The method of deciding the measurement number of times according to claim 61, characterized in including a step of performing an operational process weighted with a total measurement number of times for the necessary measurement
20 number-of-times conclusion information, the acquired measurement result, and a past measurement result, thereby to update the necessary measurement number-of-times conclusion information.

25 63 The method of deciding the measurement number of times

according to claim 53, characterized in that said measurement of said communication situation is a measurement of a radio wave propagation time.

5 **64** The method of deciding the measurement number of times according to claim 53, characterized in that said plurality of said wireless stations perform said measurement of said communication situation.

10 **65** The method of deciding the measurement number of times according to claim 53, characterized in that said wireless station that is an object of positioning performs said measurement of said communication situation.

15 **66** The method of deciding the measurement number of times according to claim 53, characterized in that said wireless station performing said measurement of said communication situation is a wireless base station.

20 **67** The method of deciding the measurement number of times according to claim 53, characterized in that said wireless station performing said measurement of said communication situation is a wireless terminal station.

25 **68** The method of deciding the measurement number of times

according to claim 53, characterized in that said decision
of the measurement number of times of said communication
situation is performed by a positioning server having a
connection with each of said plurality of said wireless
5 stations via a network.

69 The method of deciding the measurement number of times
according to claim 53, characterized in that said decision
of the measurement number of times of said communication
10 situation is performed by said plurality of said wireless
stations.

70 The method of deciding the measurement number of times
according to claim 53, characterized in that said decision
15 of the measurement number of times of said communication
situation is performed by said wireless station that is an
object of positioning.

71 The method of deciding the measurement number of times
20 according to claim 53, characterized in that said
necessary measurement number-of-times conclusion
information is information prepared by taking into
consideration the characteristic of the wireless station
that is an object of positioning, or the characteristic of
25 the wireless station other than the wireless station that

is an object of positioning, or the characteristic of a combination of said wireless station that is an object of positioning and the wireless station other than said wireless station that is an object of positioning, and a
5 positioning quality that is requested.

72 The method of deciding the measurement number of times according to claim 71, characterized in that said quality of said positioning is positioning precision information.
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73 The method of deciding the measurement number of times according to claim 71, characterized in that said quality of said positioning is use application information.

15 74 The method of deciding the measurement number of times according to claim 53, characterized in that said identification information of said wireless station is at least one of a person name using the wireless station, a personal ID of a person using the wireless station, an
20 appliance name registered to a wireless station appliance, an MAC address of the wireless station, an IP address of the wireless station, and an arbitrary ID allocated to the wireless station.

25 75 A positioning system for measuring a communication

situation between a wireless station that is an object of positioning and each of a plurality of wireless stations other than said wireless station that is an object of positioning, thereby to specify a position of said
5 wireless station that is an object of positioning, characterized in including a means for, based upon a set measurement number of times and a measurement result based upon said set measurement number of times, obtaining a new measurement number of times to performing the positioning
10 again by this measurement number of times.

76 A method of deciding a measurement number of times in a positioning system for measuring a communication situation between a wireless station that is an object of
15 positioning and each of a plurality of wireless stations other than said wireless station that is an object of positioning, thereby to specify a position of said wireless station that is an object of positioning, characterized in including a step of, based upon a set
20 measurement number of times and a measurement result based upon said set measurement number of times, deciding a new measurement number of times.

77 A positioning server, characterized in:
25 based upon a measurement result of a communication

situation between each of a plurality of wireless stations having a connection therewith and a wireless station that is a subordinate of said plurality of said wireless stations, specifying a position of said wireless station
5 that is an subordinate; and

deciding a measurement number of times of the communication situation based upon a characteristic of said wireless station that is an subordinate, or a characteristic of said plurality of said wireless stations,
10 or a characteristic of a combination of said wireless station that is an subordinate and said plurality of said wireless stations.

78 A wireless station, characterized in:

15 receiving a positioning request including information associated with a characteristic of a wireless station that is a subordinate from a server having a connection therewith to measure a distance with said wireless station that is a subordinate, and to send this measured distance
20 to said server in which a position of a terminal, being a subordinate, is specified; and

deciding a measurement number of times of said distance based upon said characteristic of said wireless station that is a subordinate.

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79 A wireless station, characterized in:

receiving a positioning request from a server, said
positioning request from said server including a
characteristic of its own wireless station and a requested
5 positioning quality, to measure distances with a plurality
of the wireless stations each of which is a connection
destination, to send said measured distances to said
server having a connection with said plurality of said
wireless stations, in which a position of its own wireless
10 station is specified: and

deciding a measurement number of times of said
distance based upon said characteristic of its own
wireless station and said requested positioning quality.